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FEDERAL - STATE - PRIVATE
COOPERATIVE SNOW SURVEYS

U. S. DEPT. OF AGRICULTURE
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MAY 25 1966

CURRENT SERIAL RECORDS

WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
WASHINGTON

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE,
and
DEPARTMENT of CONSERVATION STATE of WASHINGTON

Data included in this report were obtained by the agencies named above in cooperation with the U.S. Forest Service, U.S. Geological Survey, National Park Service, and other Federal, State and private organizations.

AS OF
MAY 1, 1966

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

To Recipients of Water Supply Outlook Reports:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season as they affect runoff will add to be an effective average. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

Listed below are water supply outlook reports based on Federal-State-Private Cooperative snow surveys. Those published by the Soil Conservation Service may be obtained from Soil Conservation Service, Room 507, Federal Building, 701 N. W. Glisan, Portland, Oregon 97209.

PUBLISHED BY SOIL CONSERVATION SERVICE

<u>REPORTS</u>	<u>ISSUED</u>	<u>LOCATION</u>	<u>COOPERATING WITH</u>
RIVER BASINS			
WESTERN UNITED STATES _____	MONTHLY (FEB.-MAY) _____	PORTLAND, OREGON _____	ALL COOPERATORS
BASIC DATA SUMMARY _____	OCTOBER 1 _____	PORTLAND, OREGON _____	ALL COOPERATORS
STATES			
ALASKA _____	MONTHLY (MAR.-MAY) _____	PALMER, ALASKA _____	ALASKA S.C.D.
ARIZONA _____	SEMI-MONTHLY _____ (JAN. 15 - APR. 1)	PHOENIX, ARIZONA _____	SALT R. VALLEY WATER USERS ASSOC. ARIZ. AGR. EXP. STATION
COLORADO AND NEW MEXICO _____	MONTHLY (FEB.-MAY) _____	FORT COLLINS, COLORADO _____	COLO. STATE UNIVERSITY COLO. STATE ENGINEER N. MEX. STATE ENGINEER
IDAHO _____	MONTHLY (JAN.-JUNE) _____	BOISE, IDAHO _____	IDAHO STATE RECLAMATION ENGINEER
MONTANA _____	MONTHLY (JAN.-JUNE) _____	BOZEMAN, MONTANA _____	MONT. AGR. EXP. STATION
NEVADA _____	MONTHLY (JAN.-MAY) _____	RENO, NEVADA _____	NEVADA DEPT. OF CONSERVATION AND NATURAL RESOURCES - DIVISION OF WATER RESOURCES
OREGON _____	MONTHLY (JAN.-JUNE) _____	PORTLAND, OREGON _____	OREG. STATE UNIVERSITY OREGON STATE ENGINEER
UTAH _____	MONTHLY (JAN.-JUNE) _____	SALT LAKE CITY, UTAH _____	UTAH STATE ENGINEER
WASHINGTON _____	MONTHLY (FEB.-JUNE) _____	SPOKANE, WASHINGTON _____	WN. STATE DEPT. OF CONSERVATION
WYOMING _____	MONTHLY (FEB.-JUNE) _____	CASPER, WYOMING _____	WYOMING STATE ENGINEER

PUBLISHED BY OTHER AGENCIES

<u>REPORTS</u>	<u>ISSUED</u>	<u>AGENCY</u>
BRITISH COLUMBIA _____	MONTHLY (FEB.-JUNE) _____	WATER RESOURCES SERVICE, DEPT. OF LANDS, FOREST AND WATER RESOURCES, PARLIAMENT BLDG., VICTORIA, B.C., CANADA
CALIFORNIA _____	MONTHLY (FEB.-MAY) _____	CALIF. DEPT. OF WATER RESOURCES, P.O. Box 388, SACRAMENTO, CALIF.

FEDERAL-STATE-COOPERATIVE
SNOW SURVEY AND WATER SUPPLY FORECASTS

For
WASHINGTON

Report Prepared
By

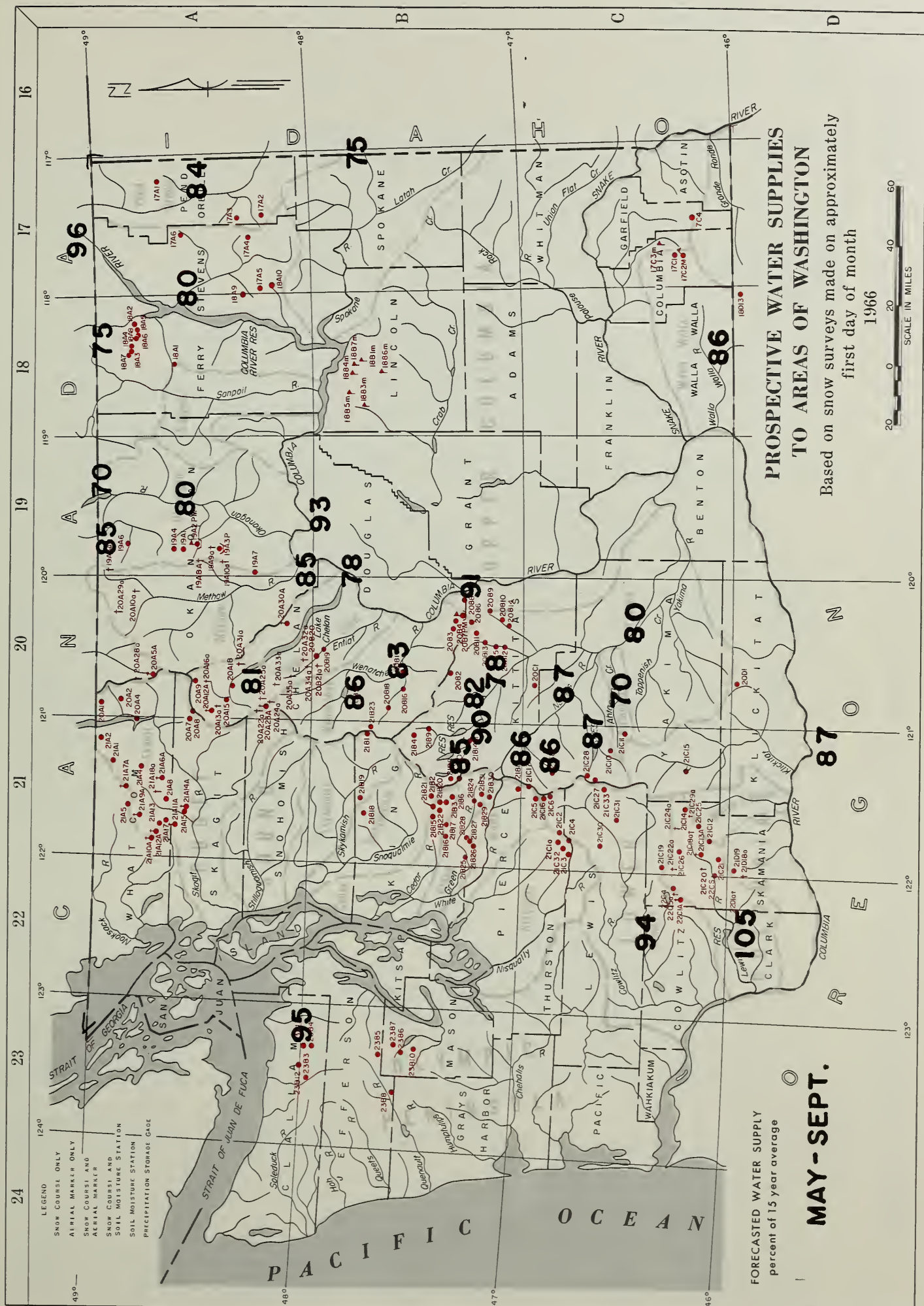
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Issued By

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Soil Conservation Service
U. S. Department of Agriculture

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Division of Water Resources
Department of Conservation
State of Washington



INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE CAGES

NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.	NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.	NAME	NUMBER	SEC.	TWP.	RANGE	ELEV.								
UPPER COLUMBIA DRAINAGE																									
Pend Oreille River																									
Boyer Mountain	17A2	31	31N	43E	5251	Squillchuck Creek	20B3	12	21N	19E	4400	Lewis River (continued)	22C1a	35	9N	5E	4700								
Bunchgrass Meadow	17A1	24	31N	44E	5000	Scout-A-Vista	20B4	18	21N	20E	3400	Plains of Abraham	22C2a	29	9N	6E	2100								
Winchester Creek	17A3	30	33N	43E	4970	Stemilt Creek	20B8	34	21N	20E	4450	Spencer Meadow	21C13a	16	7N	8E	4250								
Kettle River																									
Boulder Road	18A2	36	39N	36E	1450	Jump-Off	20B9	30	21N	20E	5000	Surprise Lakes	21C13b	16	7N	8E	4250								
Butte Creek	18A3	28	39N	35E	4070	Stemilt Slide	20B10	30	21N	20E	4400	Table Mountain	21C14	20	9N	9E	4200								
Cabin Creek	18A5	5	48N	36E	3594	Upper Wheeler	20B11	30	21N	20E	4400	Timbered Peak	21D18a	36	6N	6E	3000								
Cabin Creek	18A6	28	39N	35E	3594	Crab Creek	18B1a	38	27N	34E	2440	Cayuse Pass	21C6	15	16N	10E	5300								
Cabin Creek	18A7	5	38N	36E	2720	Creston-Kunz	18B3a	28	27N	31E	2750	Moquito Meadows	21C19	33	10N	7E	4100								
Snow Caps Trail	18A8	5	38N	36E	2720	Jack Woods	18B4a	21	27N	33E	2420	Ohanapecosh	21C2	21	13N	10E	2800								
Summit G. S.	18A9	20	39N	35E	4000	Krause	18B5a	17	27N	32E	2378	Packwood Lake	21C3	21	13N	10E	2800								
Colville River																									
Baird	17A6	19	36N	42E	3215	Sheriffa	18B6a	24	27N	33E	2440	Pigtail Peak	21C33	11	13N	11E	5900								
Carlson	17A9	34	32N	38E	2885	Wheatridge	18B6b	24	25N	32E	2290	Potato Hill	21C14	36	10N	10E	4500								
Chevelah	17A5	26	31N	38E	4990	Yakima River	21C11	26	12N	14E	3100	Willame Creek	21C30	3	13N	8E	3250								
Stranger Mountain	18A10	6	29N	38E	3370	Altman R. S.	21C12	35	23N	14E	3200	Cowlitz River													
Yogo	18A11	19	36N	35E	5350	Big Boulder Creek	21C13	28	27N	31E	2750	Cayuse Pass	21C6	15	16N	10E	5300								
Sanpoil River																									
Sherman Creek Pass	18A1	19	36N	35E	5350	Bumping Lake	21C14	21	27N	33E	2420	Moquito Meadows	21C19	33	10N	7E	4100								
Okanogan River																									
Clark	19A3a	2	36N	23E	7000	Clockum Pass	20B9	25	20N	20E	5370	Ohanapecosh	21C2	21	13N	10E	2800								
Mucknuck	19A4a	20	36N	24E	6750	Cooke Creek	20B10	17	19N	20E	4123	Packwood Lake	21C3	21	13N	10E	2800								
Guntion Creek No. 1	19A1	30	37N	24E	5700	Fish Lake	21B1a	34	24N	14E	3371	Pigtail Peak	21C33	11	13N	11E	5900								
Guntion Creek No. 2	19A2	19	37N	24E	6000	Green Lake	21C10	3	12N	13E	6000	Potato Hill	21C14	36	10N	10E	4500								
Payson	20A2a	32	40N	18E	4300	Grouse Camp	20B11	29	21N	19E	5385	Willame Creek	21C30	3	13N	8E	3250								
Rusty Creek	19A3b	18	35N	24E	4000	High Creek	20B12	34	20N	19E	2200	PUGET SOUND DRAINAGE													
Salmon Meadows	19A2b	33	37N	24E	4500	Lake Gile Elum	21B14a	15	20N	14E	2800	Nisqually River	21C4	23	15N	8E	4550								
Starvation Mtn.	19A1a	15	35N	23E	6750	Manashash	20C1	24	17N	16E	3935	Ghost Forest	21C4	23	15N	8E	4550								
Touts Coulee	19A0	30	39N	23E	2845	Morse Lake	21C17	6	16N	11E	5400	Longmire	21C3	29	15N	8E	2760								
Methow River																									
Billy Goat Pass	20A10a	10	38N	20E	6400	Nanum	20B13	4	20N	19E	3875	Paradise Park	21C2	13	15N	8E	5500								
Dollar Watch	20A29a	8	39N	20E	7000	Trail Creek	20B14	20	19N	20E	3360	Stem Glade	21C1	13	15N	8E	5500								
Harts Pass	20A5a	7	37N	18E	6500	Tunnel Avenue	21B8	13	21N	11E	2450	White River													
Horsehoe Basin	19A5a	15	40N	23E	7000	Walters Flat	20B15	22	20N	19E	3360	Corral Pass	21B13	30	18N	11E	6000								
Loup Loop	19A7	36	34N	23E	4650	White Pass (East Side)	21C28	2	13N	11E	4500	White River Entrance	21C5	4	16N	10E	3600								
Chelan Lake Basin																									
Bridge Creek	20A15	20	34N	16E	2100	White Pass (Leach Lake)	21C27	1	13N	11E	4500	White River Entrance (new)	21C16	4	16N	10E	3400								
Bullion	20A18	2	33N	16E	1460	LOWER COLUMBIA DRAINAGE												Deer Park	23B4	1	28N	5W	5200		
Cloudy Pass	20A22a	12	31N	15E	6500	Asotin Creek	17C4	9	8N	42E	5700	Green River	21B24	18	20N	11E	1800	Morse Creek	23B13	1	28N	5W	4850		
Greenwood Flat	20A25a	3	31N	16E	3540	Mill Creek	17C3m	2	9N	35E	3370	Charley Creek	21B25	27	21N	8E	1200	Morse Creek	23B12	25	29N	7W	5425		
Little Meadows	20A24a	8	31N	16E	5275	Couse	17C3n	11	9N	40E	4030	Grass Mountain No. 1	21B26	21	20N	8E	4900	Elwho River			23B3	36	29N	7W	4500
Lyman Lake	20A23a	18	31N	16E	5900	Martin Springs (Helmets SW)	17C2m	23	9N	40E	4400	Grass Mountain No. 2	21B27	14	20N	8E	2900	Skokomish River			23B7	17	24N	5W	4200
Park Creek Flat	20A13a	18	34N	16E	2220	Walla Walla Diversion	18D13	22	6N	38E	2100	Lester Creek	21B28	12	20N	8E	2100	Black and White	23B6	16	24N	5W	4700		
Park Creek Ridge	20A12a	7	34N	16E	4600	Spruce Springs	17C4	9	8N	42E	5700	Samhill Ridge	21B31	5	19N	11E	4700	Black and White Lakes	23B7	17	24N	5W	4200		
Petersons	20A16a	3	34N	17E	3730	Klickitat River	Couse	17C3m	2	9N	35E	3370	Stampede Pass	21B35	8	22N	9E	3000	Four Stream	23B10	1	23N	6W	3000	
Rainy Pass	20A9	21	35N	17E	4780	Satus Pass	20D1	21	6N	17E	4030	South Fork Cedar	21B17	11	21N	9E	2400	Home Sweet Home	23B5	28	25N	5W	5200		
Safety Harbor	20A30a	32	31N	20E	6300	West Fork Cabin	21C15	23	9N	12E	3000	Tinkham Creek	21B6	24	21N	10E	3000	Sundown Pass	23B8	25	24N	7W	3900		
War Creek Pass	20A31a	34	33N	18E	6500	Cultus Creek	21C12	35	7N	8E	4000	Snoqualmie River	21B20	1	21N	10E	3400	LEGEND			21A7	SNOW COURSE ONLY			
Entiat River																		NUMBERING SYSTEM EXAMPLE			21A7	SNOW COURSE ONLY			
Brief	20B19	34	28N	19E	1600	Blue Lake	21C22a	19	9N	8E	4800	Skykomish River	21B19	33	26N	10E	2900	21A7	SNOW COURSE ONLY						
Entiat Meadows	20A33a	28	31N	17E	4800	Bob's Trail	21C21	25	8N	7E	2200	Olallie Meadows	21B2	19	22N	11E	3625	21A7a	AERIAL MARKER ONLY						
Entiat River Trail	20A34a	2	29N	17E	3150	Galemitry Ridge	22D1a	8	5N	5E	2500	South Fork Tolt	21B18	26	26N	9E	1900	21A7a	SNOW COURSE AND SOIL MOISTURE STATION						
Fope Ridge	20B20	22	29N	18E	4300	Council Pass	21C18a	24	9N	9E	4200	Lake Elizabeth	21B19	33	26N	10E	2900	21A7b	SNOW COURSE AND SOIL MOISTURE STATION						
Pugh Ridge	20A32a	34	30N	18E	6400	Divide Meadow	21C29a	21	9N	10E	5600	Beaver Creek Trail	21A4	35	39N	12E	2200	21A7b	SNOW COURSE AND SOIL MOISTURE STATION						
Snow Brushy	20A35a	21	30N	17E	3850	Grand Meadow	21C25	28	8N	9E	3500	Beaver Pass	21A1	39	39N	12E	3680	21A7b	SNOW COURSE AND SOIL MOISTURE STATION						
Tommy Creek	20B21a	10	28N	18E	5300	Lone Pine Shelter	22C26	4	9N	7E	3800	Devils Park	20A4	34	38N	16E	5900	21A7b	PRECIPITATION STORAGE GAGE						
Wenatchee River																		21A7	PRECIPITATION STORAGE GAGE						
Berne-Nill Creek	21B23	7	26N	15E	2925	New Muddy River	22C6	36	6N	7E	3100	Skagit River (continued)						21A7	PRECIPITATION STORAGE GAGE						
Bleuett Pass No. 2	20B2	35	22N	17E	4270	Oldman Pass	21D19	22	6N	7E	3100	Freezeout Creek Trail	20A1	12	40N	14E	3500	21A7	PRECIPITATION STORAGE GAGE						
Chiwaukum G. S.	20B16	4	25N	17E	1810	Bob's Trail	21C21	25	8N	7E	2200	Freezeout Meadows	20A2	29	40N	14E	5000	21A7	PRECIPITATION STORAGE GAGE						
Lake Wenatchee	20B5	33	27N	17E	1970	Galemitry Ridge	22D1a	8	5N	5E	2500	Lake Hazen	21A1	29	40N	14E	2600	21A7	PRECIPITATION STORAGE GAGE						
Leavenworth R. S.	20B17	1	24N	17E	1127	Divide Meadow	21C29a	21	9N	10E	5600	Meadows Cabins	20A8	29	36N	14E	1900	21A7	PRECIPITATION STORAGE GAGE						
Perritt	20B18	4	26N	16E	2140	Lone Pine Shelter	22C26	4	9N	7E	3800	Thunder Basin	20A7	15	35N	14E	4200	21A7	PRECIPITATION STORAGE GAGE						
Reverens Pass	21B1	14	26N	13E	4070	Marble Mountain	22C5a	24	8N	5E	3200	Baker River						21A7	PRECIPITATION STORAGE GAGE						
Dungeness River																		21A7	PRECIPITATION STORAGE GAGE						
Deer Park	23B4	1	28N	5W	5200	New Muddy River	22C6	36	6N	7E	3100	Dock Butte	21A11a	8	34N	8E	3800	21A7	PRECIPITATION STORAGE GAGE						
Morse Creek	23B13	1	28N	5W	4850	Oldman Pass	21D19	22	6N	7E	3100	Fady Pass	21A17a	19	37N	11E	5200	21A7	PRECIPITATION STORAGE GAGE						
Morse Creek	23B12	25	29N	7W	5425	Beaver Pass	21A1	39	39N	12E	3680	Jaapor Pass	21A6a	17	38N	11E	5400	21A7	PRECIPITATION STORAGE GAGE						
Skokomish River																		21A7	PRECIPITATION STORAGE GAGE						
Hurricane	23B3	36	29N	7W	4500	Beaver Pass	21A1	39	39N	12E	3680	Marten Lake	21A9a	23	38N	8E	3600	21A7	PRECIPITATION STORAGE GAGE						
Black and White	23B7	17	24N	5W	4200	Devils Park	20A4	34	38N	16E	5900	Mount Blum	21A18a	27	38N	10E	5800	21A7	PRECIPITATION STORAGE GAGE						
Black and White Lakes	23B6	16	24N	5W	4700	Beaver Creek Trail	21A4	35	39N	12E	2200	Rocky Creek	21A12a	40	37N	8E	2100	21A7	PRECIPITATION STORAGE GAGE						
Four Stream	23B10	1	23N	6W	3000	Beaver Pass	21A1	39	39N	12E	3680	Schreibers Meadow	21A10a	18	37N	8E	2200	21A7	PRECIPITATION STORAGE GAGE						
Home Sweet Home	23B5	28	25N	5W	5200	Devils Park	20A4	34	38N	16E	5900	S. F. Thunder Creek	21A14a	20	34N	9E	4200	21A7	PRECIPITATION STORAGE GAGE						
Sundown Pass	23B8	25	24N	7W	3900	Beaver Pass	21A1	39	39N	12E	3680	Sulphur Creek	21A13	22	37N	8E	1600	21A7	PRECIPITATION STORAGE GAGE						

WATER SUPPLY OUTLOOK

State of Washington
May 1, 1966

* * * * *
* The water supply outlook for irrigation and power in the State of *
* Washington and tributary watersheds has deteriorated from that *
* which was reported last month. Conditions can now be called fair.*
* The month of April was characterized by hot, dry weather. This *
* depleted the snowpack much faster than normal and prevented the *
* expected runoff from occurring. The snowpack at the higher ele- *
* vations is still reasonably good in most locations but the middle *
* and lower courses are bare of snow. Precipitation was extremely *
* low and many stations recorded only a trace. Runoff during the *
* month was generally below normal with only a few stations report- *
* ing above average flows for the month. *
* * * * *

SNOW COVER

Many of the snow courses in the state and surrounding areas are not measured on the first of May because of low elevations. The snow courses that are measured indicate a snowpack that is 80% of last year at this time east of the Cascades and 70% of normal for this area. The lower Columbia drainage has a snowpack that is 25% greater than last year but 12% less than average. In the Puget Sound area the snow cover is 4% greater than last year but 22% less than normal. The only truly bright spot in the state is the Olympic Peninsula which has a snowpack 47% greater than last year and 5% greater than average.

RESERVOIRS

The reservoir storage picture is not as bright as was painted last month. Most reservoirs still have below normal amounts of water but most will fill with the spring runoff. In the Okanogan area Conconully Reservoir which had been pulled down is not expected to fill. In the Yakima area all reservoirs will not spill unless this warm, dry weather is replaced with above normal precipitation.

PRECIPITATION

All of the drainage divisions were reported by the U. S. Weather Bureau to have sub-normal rainfall during the month of April. These deficiencies were great enough to overcome most of the above normal precipitation measurements reported in March which leaves the March-April spring precipitation picture on the negative side. Only those stations reporting from the Columbia Basin in British Columbia ended up with a spring rainfall on the plus side of the ledger. Many of

The Washington Station reported only a trace of rain during the entire month of April.

SOIL MOISTURE

As can be expected, May 1 soil moisture is not too indicative of long-term conditions. Many of the stations are measured under varying conditions which would normally make the soil moisture in a fairly accurate on this subject. Some of the stations in Washington are located in crop land areas and some in urban areas. The very slight increase in soil moisture in May is not too significant. These stations have not been in operation long enough to develop long-term records.

STATIONARY

With a few exceptions all stations during the month of April show little or no change in soil moisture. Stations in the Washington area have been lowered as much as 100 in the ground. This decrease of the forecast period is due to the lack of precipitation during the month as well as the above normal temperatures which occurred in April. Forecasts for the indicated stations and their percentages in terms of rainfall can be found on the following pages.

STREAMFLOW FORECAST - MAY 1966

The following summarized runoff forecasts are based principally on mountain snow cover and on the assumption that precipitation and temperature will be near average from the present time to the end of the forecast period. Appreciable deviations from normal of temperature and/or precipitation will correspondingly modify these forecasts.

Basin, Stream and Station	Forecast Runoff 1966	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast Period	Measured Runoff			15 Yr. Average
				1965	1964	1963	1948-62
<u>COLUMBIA BASIN</u>							
<u>Columbia River System</u>							
<u>Columbia River</u>							
at Birchbank <u>1/</u>	41000	96	May-Sep	40272	44217	38604	42519
	31800	96	May-Jul	29971	34170	28975	33008
	21900	97	May-Jun	20219	21448	19469	22475
<u>Columbia River</u>							
at Grand Coulee <u>1/</u>	58900	93	May-Sep	61301	66239	52072	63335
	48900	94	May-Jul	48555	54148	41073	52003
	36300	94	May-Jun	36140	38302	29427	38569
<u>Columbia River</u>							
bl. Rock Island Dam <u>1/</u>	63500	91	May-Sep	65579	72608	56454	69730
	51600	90	May-Jul	52352	59531	44898	57384
	38800	91	May-Jun	38638	41916	32451	42595
<u>Columbia River</u>							
at The Dalles, Ore. <u>1/</u>	82500	87	May-Sep	96282	100902	76867	94841
	68400	87	May-Jul	78392	83876	61720	78671
	53200	88	May-Jun	60321	61986	46210	60426
<u>Pend Oreille River System</u>							
<u>Pend Oreille River</u>							
bl. Box Canyon	12200	84	May-Sep		16702	9974	14549
	11000	83	May-Jul		15035	8952	13215
	9300	84	May-Jun		12446	7355	11043
<u>Kettle River System</u>							
Kettle River	1320	75	May-Sep	1505	1885	1181	1754
nr. Laurier	1240	75	May-Jul	1407	1661	1120	1654
	1100	74	May-Jun	1302	1442	980	1477

1/ Observed flow corrected for storage in any of the following reservoirs which are above the station: Kootenay Lake, Hungry Horse, Flathead Lake, Pend Oreille Lake, F. D. Roosevelt Lake, Lake Chelan, Coeur d'Alene Lake, Brownlee, Noxon Reservoir and pumpage at F. D. Roosevelt Lake.

Streamflow Forecasts - May 1966 (Cont.)

Basin, Stream and Station	Forecast Runoff 1966	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast Period	1965	Measured 1964	Runoff 1963	15-Yr. Average 1948-62
<u>Kettle River System (Cont.)</u>							
Colville River							
at Kettle Falls	95	80	May-Sep	93	62	71	119
	83	80	May-Jul	81	53	62	104
	72	79	May-Jun	73	47	55	91
<u>Spokane River System*</u>							
Spokane River							
at Post Falls, Ida. <u>2/</u>	1700	75	May-Sep	1924	2986	1085	2262
	1600	74	May-Jul	1789	2826	1023	2160
	1500	75	May-Jun	1646	2616	945	2002
<u>Okanogan River System**</u>							
Similkameen River							
nr. Nighthawk	1320	85	May-Sep	1261	1778	1140	1556
	1240	86	May-Jul	1144	1629	989	1441
	1050	86	May-Jun	1015	1266	773	1222
Okanogan River							
at Oroville <u>3/</u>	300	70	May-Sep		358	199	430
	295	69	May-Jul		314	201	428
	285	70	May-Jun		284	169	407
Okanogan River							
nr. Tonasket	1440	80	May-Sep	1492	1928	1150	1804
	1290	80	May-Jul	1350	1693	990	1618
	1090	81	May-Jun	1168	1289	766	1350
<u>Methow River System**</u>							
Methow River							
nr. Pateros	910	85	May-Sep	783	889	819	1069
	840	85	May-Jul	705	823	743	987
	700	84	May-Jun	595	669	624	831

* Forecasts made by Morlan W. Nelson and J. Alden Wilson, Soil Conservation Service, Boise, Idaho.

** These forecasts are based in part upon base flow data especially prepared and furnished for the purpose by the U. S. Geological Survey.

2/ Observed flow corrected for storage in Coeur d'Alene Lake and diversions by Spokane Valley Farms Company and Rathdrum Prairie Canals.

3/ Observed flow corrected for storage and diversions.

4/ Observed flow corrected for storage in Lake Chelan.

Streamflow Forecasts - May 1966 (Cont.)

Basin, Stream and Station	Forecast Runoff 1966	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast Period	1965	Measured Runoff 1964	15-Yr. Average 1963 1948-62	
<u>Chelan River System</u>							
Chelan River							
at Chelan <u>4/</u>	950	78	May-Sep		1210	853	1221
	830	78	May-Jul		1058	720	1070
	650	80	May-Jun		738	573	814
Stehekin River							
at Stehekin	700	81	May-Sep		889	644	861
	590	81	May-Jul		756	524	728
	440	82	May-Jun		519	405	535
<u>Wenatchee River System</u>							
Wenatchee River							
at Plain	1060	86	May-Sep		1364	758	1238
	960	87	May-Jul		1191	668	1108
	750	88	May-Jun		820	551	854
Wenatchee River							
at Peshastin	1410	83	May-Sep	1483	1812	1031	1700
	1280	83	May-Jul	1337	1597	915	1535
	1000	84	May-Jun	1058	1114	760	1191
Stemilt Basin							
nr. Wenatchee	125		May-Sep	132*	146*	138*	--
<u>Yakima River System</u>							
Yakima River							
nr. Martin <u>5/</u>	110	85	May-Sep	94	183	55	130
	99	84	May-Jul	88	162	50	118
	83	85	May-Jun	78	118	44	98
Yakima River							
at Cle Elum <u>6/</u>	660	78	May-Sep		1113	457	857
	600	78	May-Jul		986	397	772
	510	79	May-Jun		748	340	645
Yakima River							
nr. Parker <u>7/</u>	1220	80	May-Sep		1748	604	1533
	1220	81	May-Jul		1660	624	1505
	1110	83	May-Jun		1349	611	1343
Kachess River							
nr. Easton <u>8/</u>	102	90	May-Sep	81	153	44	113
	97	92	May-Jul	77	139	44	106
	84	92	May-Jun	69	106	39	91

* Thousands of Miners' Inches.

5/ Observed flow corrected for storage in Lake Keechelus.

6/ Observed flow corrected for storage in Keechelus, Kachess and Cle Elum Lakes and diversion by Kittitas Canal.

7/ Observed flow corrected for storage in Keechelus, Kachess, Cle Elum, Bumping and Rimrock Lakes and diversions by Roza, Union Gap, New Reservation, Old Reservation and Sunnyside Canals.

8/ Observed flow corrected for storage in Lake Kachess.

Streamflow Forecasts - May 1966 (Cont)

Basin, Stream and Station	Forecast Runoff 1966	Seasonal Streamflow in Thousands of Acre-Feet					
		% 15-Yr. Avg.	Fore- cast Period	1965	Measured Runoff 1964	15-Yr. Average 1963 1948-62	
<u>Yakima River System (Cont)</u>							
Cle Elum River							
nr. Roslyn <u>9/</u>	370	82	May-Sep	362	533	242	449
	340	84	May-Jul	330	475	220	407
	275	83	May-Jun	276	353	190	332
Bumping River							
nr. Nile <u>10/</u>	125	86	May-Sep	112	159	73	145
	115	87	May-Jul	103	140	66	132
	92	87	May-Jun	87	99	58	106
American River							
nr. Nile	105	86	May-Sep		123	71	122
	96	86	May-Jul		111	65	112
	77	86	May-Jun		82	55	90
Tieton River							
at Tieton Dam <u>11/</u>	210	87	May-Sep	179	217	144	242
	175	87	May-Jul	154	182	114	202
	135	87	May-Jun	122	127	94	155
Naches River							
nr. Naches <u>12/</u>	720	87	May-Sep		829	476	823
	650	88	May-Jul		734	414	740
	530	87	May-Jun		558	356	608
Ahtanum Creeks							
nr. Tampico <u>13/</u>	32	70	May-Sep		31	30	45
	28	70	May-Jul		27	27	40
	24	71	May-Jun		22	23	34
<u>Lower Columbia River System</u>							
Mill Creek							
nr. Walla Walla	19	86	May-Sep	16	22	12	22
	15	83	May-Jul	12	18	9	18
	13	87	May-Jun	10	16	7	15
Lewis River							
at Ariel <u>14/</u>	1080	105	May-Sep	688	1141	676	1030
	920	106	May-Jul	571	924	557	866
	760	106	May-Jun	485	743	466	720
Cowlitz River							
at Castle Rock <u>15/</u>	2100	94	May-Sep	1593	2736	1482	2236
	1790	94	May-Jul	1320	2290	1204	1902
	1430	94	May-Jun	1069	1745	972	1526

9/ Observed flow corrected for storage in Lake Cle Elum.

10/ Observed flow corrected for storage in Bumping Lake.

11/ Observed flow corrected for storage in Rimrock Lake.

12/ Observed flow corrected for storage in Bumping and Rimrock Lakes and diversions by Tieton, Selah Valley, Wapatox Canals and City of Yakima.

13/ Observed flow of North and South Forks (combined).

14/ Observed flow corrected for storage in Lake Merwin, Yale and Swift Reservoirs.

15/ Observed flow corrected for storage in Mayfield Reservoir.

Streamflow Forecasts - May 1966 (Cont.)

Basin, Stream and Station	Forecast Runoff 1966	Seasonal Streamflow in Thousands of Acre-Feet					
		%	Fore- cast 15-Yr. Avg. Period	Measured Runoff			15-Yr. Average
				1965	1964	1963	

OLYMPIC PENINSULA

<u>Dungeness River System</u>							
Dungeness River							
nr. Sequim	150	95	May-Sep	110	144	120	158
	120	94	May-Jul	88	116	92	127
	88	97	May-Jun	65	79	64	91
<u>Grays Harbor River</u>							
Grays Harbor	200	95	May-Sep	150	200	180	220
	150	94	May-Jul	100	150	120	170
	100	97	May-Jun	75	100	80	120
<u>Nemah River</u>							
Nemah River	100	95	May-Sep	75	100	90	110
	75	94	May-Jul	50	75	60	85
	50	97	May-Jun	35	50	40	60
<u>Willapa River</u>							
Willapa River	150	95	May-Sep	100	150	130	170
	100	94	May-Jul	75	100	80	120
	75	97	May-Jun	50	75	60	90
<u>Yakima River</u>							
Yakima River	200	95	May-Sep	150	200	180	220
	150	94	May-Jul	100	150	120	170
	100	97	May-Jun	75	100	80	120
<u>Wahkiakum River</u>							
Wahkiakum River	100	95	May-Sep	75	100	90	110
	75	94	May-Jul	50	75	60	85
	50	97	May-Jun	35	50	40	60
<u>Washouli River</u>							
Washouli River	100	95	May-Sep	75	100	90	110
	75	94	May-Jul	50	75	60	85
	50	97	May-Jun	35	50	40	60
<u>Wishkah River</u>							
Wishkah River	100	95	May-Sep	75	100	90	110
	75	94	May-Jul	50	75	60	85
	50	97	May-Jun	35	50	40	60
<u>Yakima River (Lower)</u>							
Yakima River	200	95	May-Sep	150	200	180	220
	150	94	May-Jul	100	150	120	170
	100	97	May-Jun	75	100	80	120

Based on historic average
Less than historic value/ in period 1948-62
Overall average 1948-62

Streamflow Forecast - May 1966 (Cont.)

Station	1966	Avg. Period	1962	1964	1963 1964-65	1965-66
Basin, Stream and	Forecast	15-Yr. Cast	Forecast	Forecast	Forecast	Forecast

OLYMPIC PENINSULA

Dungeness River Station

Station	1966	1967	1968	1969	1970	1971	1972
Dungeness River	120	95	85	80	75	70	65
at Redfish	150	95	85	80	75	70	65
	28	97	87	82	78	74	70

RESERVOIR STORAGE - 1000 Acre Feet

BASIN or STREAM	RESERVOIR	USABLE ^{1/} CAPACITY	Measured (May 1) 1966	1965	1964	Normal*
<u>COLUMBIA</u>						
Spokane	Coeur d'Alene Lake	225.1	172.8	524.3	242.8	347.7
Columbia	Franklin D. Roosevelt Lake	5232.0	2786.0	3252.0	2984.0	3088.2
Columbia	Banks Lake ^{2/}	761.8	401.6	247.4	120.6	450.0
Okanogan	Conconully Reservoir	13.0	1.2	6.1	5.1	9.1
Okanogan	Salmon Lake	10.5	7.6	8.1	9.5	9.2
Chelan	Lake Chelan	676.1	137.6	369.3	121.8	239.3
<u>YAKIMA</u>						
Yakima	Keechelus Lake	157.8	127.8	122.2	74.2	111.3
Kachess	Kachess Lake	239.0	176.9	215.7	172.2	200.5
Cle Elum	Lake Cle Elum	436.9	283.0	387.3	142.4	328.4
Bumping	Bumping Lake	33.7	8.3	17.6	4.6	21.0
Tieton	Rimrock Lake	198.0	119.6	182.3	79.2	149.9
<u>PUGET SOUND</u>						
Skagit	Ross Reservoir ^{2/}	1202.9	571.2	839.1	718.0	511.2
Skagit	Diablo Reservoir	90.6	85.8	85.1	84.0	85.2
Skagit	Gorge Reservoir	9.8	8.2	7.8	8.2	--

^{1/} Based on Active Storage

^{2/} Less than 15-year record in period 1948-62

* 15-year average 1948-62

SOIL MOISTURE - MAY

Drainage Basin and Station	Number	Elev.	Profile (Inches) :		Soil Moisture Content		
			Depth	Total Capacity :	(Inches) as of May 1		
					1966	1965	1964
<u>CRAB CREEK</u>							
Creston-Kunz	18B1m	2440	48	13.6	10.6	10.5	10.8
Jack Woods	18B3m	2600	48	13.6	9.4	9.4	9.3
Krause	18B4m	2440	48	13.6	8.9	9.1	9.9
Sheffels	18B5m	2360	48	13.6	7.6	8.7	6.1
Wheatridge	18B6m	2200	48	13.6	7.4	8.4	7.9
<u>OKANOGAN</u>							
Trout Creek	3-M	3600	48	7.3	5.7*	6.3	7.3
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	4.9	4.9	--
Lake Cle Elum	21B14M	2200	48	12.8	9.2	9.0	9.1
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	7.5	10.8	9.6
Helmerts	17C2M	4400	48	12.0	10.8	12.4	11.0
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	11.6	10.3	--

* April 15 measurement

FALL SOIL MOISTURE

Drainage Basin and Station	Number	Elev.	Profile (Inches) :		Soil Moisture Content		
			Depth	Total Capacity :	(Inches) as of Oct. 1		
					1965	1964	1963
<u>CRAB CREEK</u>							
Creston-Kunz	18B1m	2440	48	13.6	4.9	5.4	5.1
Jack Woods	18B3m	2600	48	13.6	5.0	4.4	6.3
Krause	18B4m	2440	48	13.6	5.8	5.9	5.2
Sheffels	18B5m	2360	48	13.6	4.0	3.7	3.7
Wheatridge	18B6m	2200	48	13.6	4.2	4.1	4.5
<u>OKANOGAN</u>							
Trout Creek	3-M	3600	48	7.3	4.1	4.9	4.1
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	1.9	4.4	--
Lake Cle Elum	21B14M	2200	48	12.8	6.9	8.5	6.6
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	6.0	5.6	5.7
Helmerts	17C2M	4400	48	12.0	6.2	6.0	5.8
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	6.2	5.3	--

PRECIPITATION ^{1/}

Division averages and Departures

DRAINAGE DIVISIONS	Sept-Nov. 1965 ^{2/}		Dec. '65-Feb. '66 ^{2/}		Mar-April '66 ^{2/}	
	Observed	Departure	Observed	Departure	Observed	Departure
Columbia in Canada	6.01	-0.36	9.68	+0.89	3.08	+0.10
Pend Oreille - Spokane	5.44	-3.50	8.94	-3.23	4.71	-0.30
Northeastern Washington	3.31	-2.00	4.97	-2.31	2.40	-0.59
Southeastern Washington	2.84	-3.03	5.71	-2.28	3.07	-0.85
Central Washington	5.55	-6.32	15.27	-3.43	3.29	-2.34
North Central Washington	1.65	-1.38	3.63	-1.06	1.26	-0.51
Northwest Slope Cascades	16.93	-8.11	27.13	-6.32	12.03	-1.46
Southwest Slope Cascades	11.21	-6.88	23.04	-3.09	10.13	-0.48
Blue Mountains, Oregon	2.49	-2.23	4.89	-2.32	1.98	-1.46
Lower Columbia in Oregon	3.23	-1.17	5.97	-2.21	1.62	-1.53

Northeastern Washington - Lower Spokane, Colville, Sanpoil and lower Kattle drainages

Southeastern Washington - Touchet, Tucannon and Palouse drainages

Central Washington - Yakima, Wenatchee and Chelan drainages

North Central Washington - Methow and Okanogan drainages

Northwest Slope Cascades - Puget Sound drainages

Southwest Slope Cascades - Lower Columbia drainages

^{1/} - Preliminary analysis by U. S. Weather Bureau from data furnished by Meteorological Services of Canada and U. S. Weather Bureau

^{2/} - Departure from 15-year (1948-62) drainage division average

Note - Precipitation shown in inches

SECTION 1 DIVERSITY, VARIATION AND DISPERSED

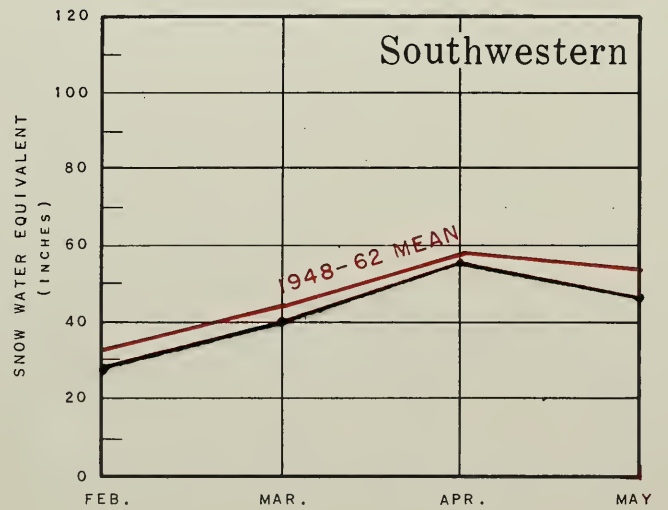
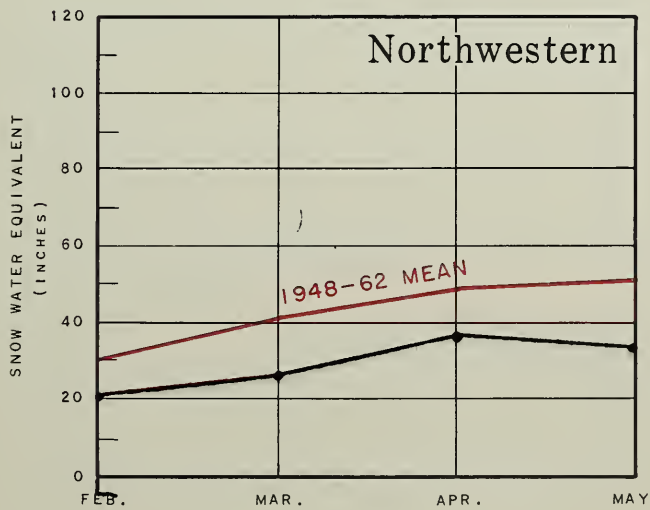
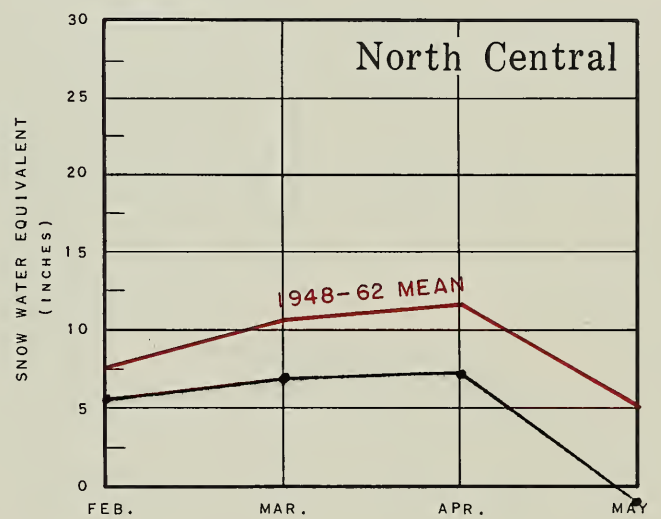
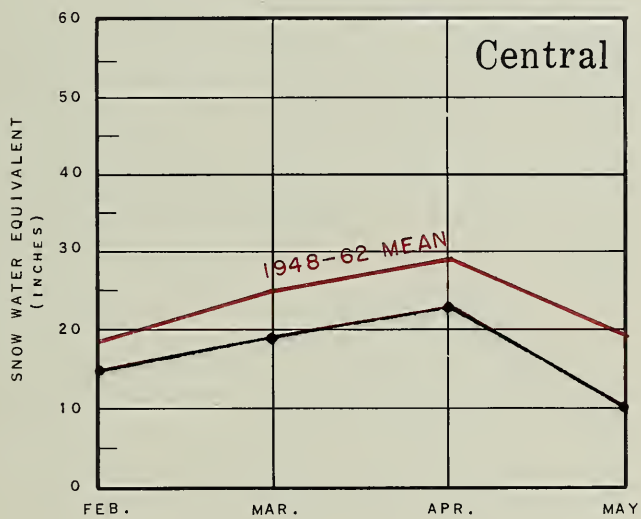
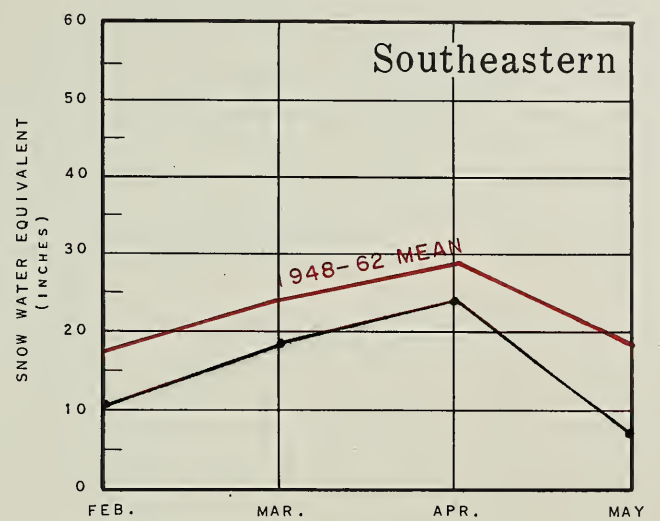
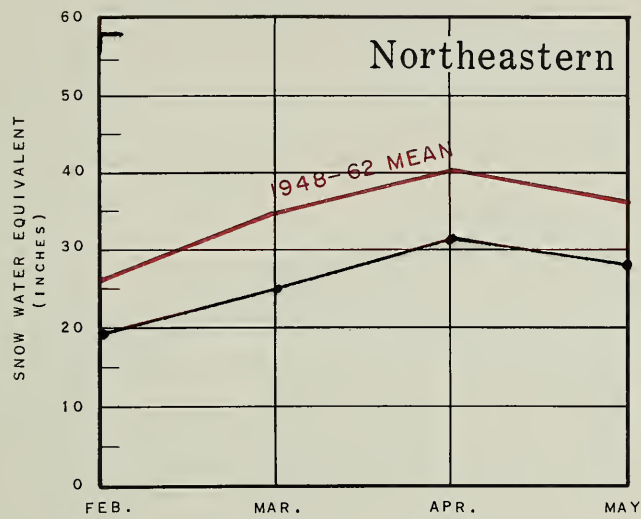
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STATION 11	01:31 - 02:00	010	10.0	010	10.0
STATION 12	02:01 - 02:30	010	10.0	010	10.0
STATION 13	02:31 - 03:00	010	10.0	010	10.0
STATION 14	03:01 - 03:30	010	10.0	010	10.0
STATION 15	03:31 - 04:00	010	10.0	010	10.0
STATION 16	04:01 - 04:30	010	10.0	010	10.0
STATION 17	04:31 - 05:00	010	10.0	010	10.0
STATION 18	05:01 - 05:30	010	10.0	010	10.0
STATION 19	05:31 - 06:00	010	10.0	010	10.0
STATION 20	06:01 - 06:30	010	10.0	010	10.0
STATION 21	06:31 - 07:00	010	10.0	010	10.0
STATION 22	07:01 - 07:30	010	10.0	010	10.0
STATION 23	07:31 - 08:00	010	10.0	010	10.0
STATION 24	08:01 - 08:30	010	10.0	010	10.0
STATION 25	08:31 - 09:00	010	10.0	010	10.0
STATION 26	09:01 - 09:30	010	10.0	010	10.0
STATION 27	09:31 - 10:00	010	10.0	010	10.0
STATION 28	10:01 - 10:30	010	10.0	010	10.0
STATION 29	10:31 - 11:00	010	10.0	010	10.0
STATION 30	11:01 - 11:30	010	10.0	010	10.0
STATION 31	11:31 - 12:00	010	10.0	010	10.0
STATION 32	12:01 - 12:30	010	10.0	010	10.0
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STATION 34	13:01 - 13:30	010	10.0	010	10.0
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STATION 37	14:31 - 15:00	010	10.0	010	10.0
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STATION 53	22:31 - 23:00	010	10.0	010	10.0
STATION 54	23:01 - 23:30	010	10.0	010	10.0
STATION 55	23:31 - 00:00	010	10.0	010	10.0

STATION 10 - Lower Columbia River, near Astoria, Oregon
 STATION 11 - Lower Columbia River, near Astoria, Oregon
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 STATION 13 - Lower Columbia River, near Astoria, Oregon
 STATION 14 - Lower Columbia River, near Astoria, Oregon
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 STATION 54 - Lower Columbia River, near Astoria, Oregon
 STATION 55 - Lower Columbia River, near Astoria, Oregon

WASHINGTON SNOW COVER

1966

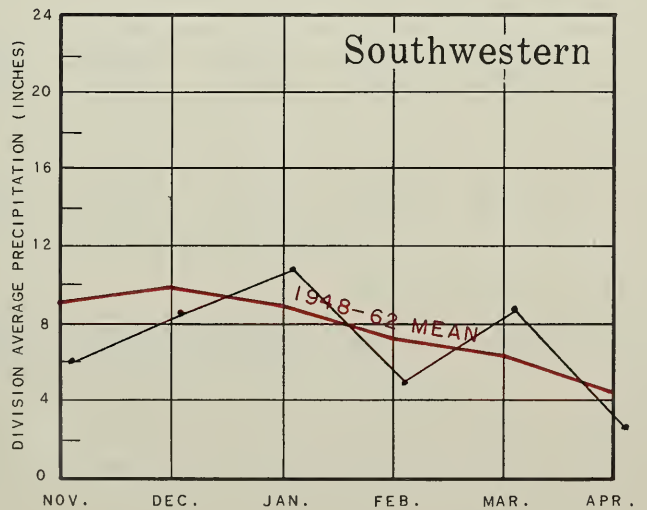
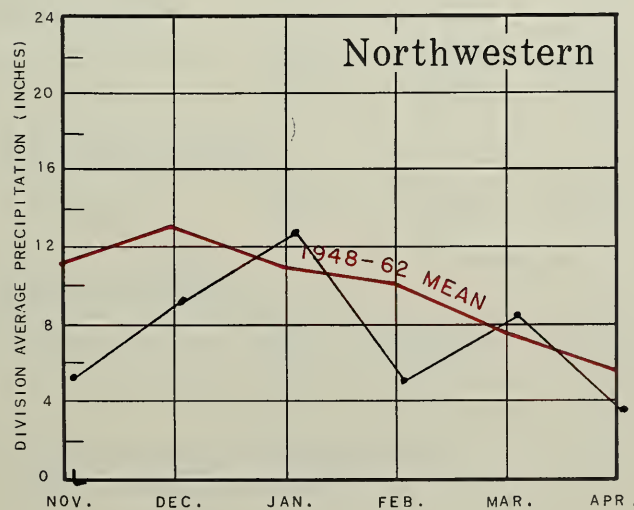
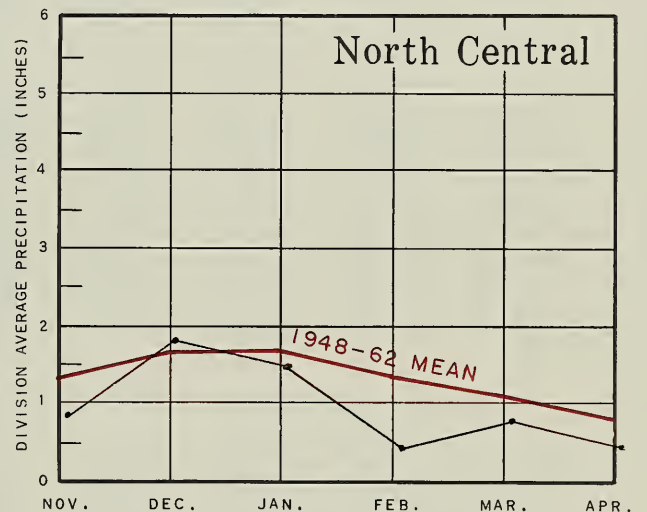
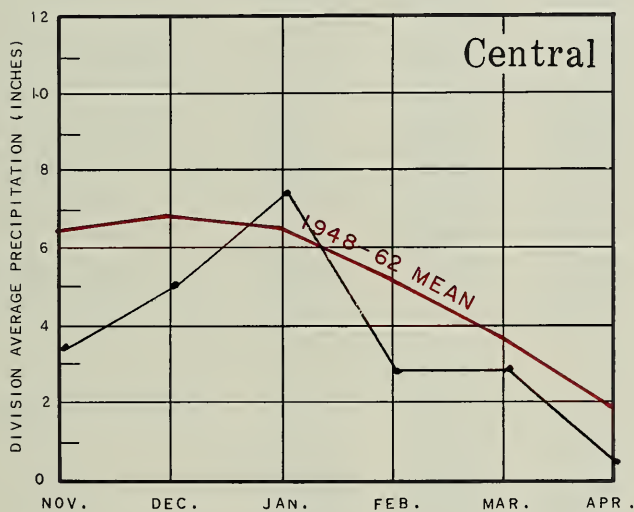
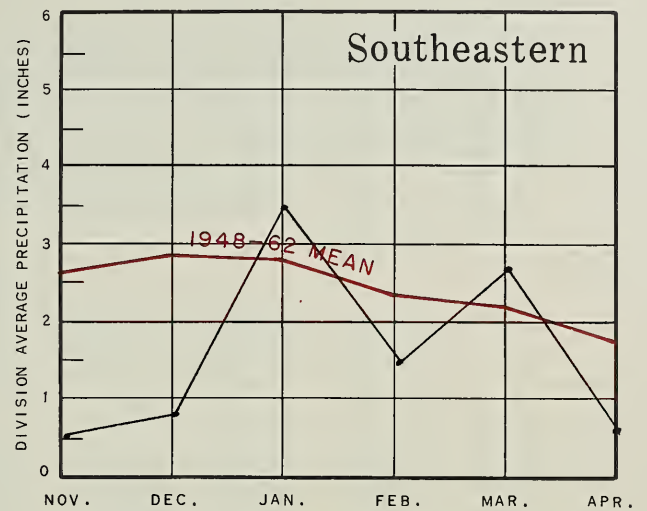
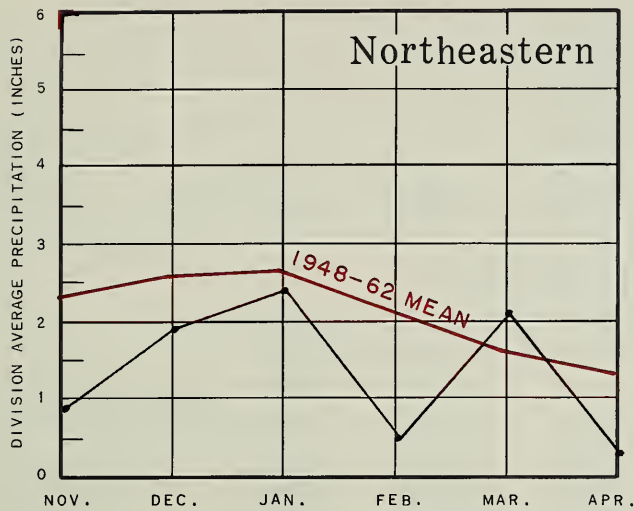
DRAINAGE AREAS



WASHINGTON VALLEY PRECIPITATION

1965 - 1966

DRAINAGE AREAS



APPENDIX 1

SNOW DATA MAY 1, 1966

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT					
			1966	:P a s t R e c o r d				
			Date of Survey	Snow Depth (In.)	Water Content: (In.)	1965	1964	1948-62 Avg.

MID-MONTH SURVEYS

Snow Surveys made on or about April 15, 1966

WENATCHEE RIVER

Blewett Pass #2	20B2	4270	4/15	22	10.1	15.1	15.0	15.8*
Lake Wenatchee	20B5	1970	4/19	7	3.0	--	--	--
Stevens Pass	21B1	4070	4/13	109	49.3	59.2	81.0	57.0*

YAKIMA RIVER

#Blewett Pass #2	20B2	4270	4/15	22	10.1	15.1	15.0	15.8*
Bumping Lake	21C8	3450	4/14	38	16.5	11.1	16.1	15.2*
Lake Cle Elum	21B14M	2200	4/19	0	0.0	0.0	1.9	2.6*
#Olallie Meadows	21B2	3625	4/14	102	48.6	57.6	85.2	54.3*
#Stampede Pass	21B10	3000	4/14	88	42.6	51.7	62.2	52.0*
Tunnel Avenue	21B8	2450	4/19	40	16.3	23.8	40.4	25.7*
White Pass (E. Side)	21C28	4500	4/18	50	22.7	27.6	31.1	31.1*

COWLITZ RIVER

#White Pass (E. Side)	21C28	4500	4/18	50	22.7	27.6	31.1	31.1*
Pigtail Peak	21C33	5900	4/16	115	55.2	68.9	96.5	--

GREEN RIVER

Stampede Pass	21B10	3000	4/14	88	42.6	51.7	62.2	52.0*
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SNOQUALMIE RIVER

Olallie Meadows	21B2	3625	4/14	102	48.6	57.6	85.2	54.3*
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SKYKOMISH RIVER

#Stevens Pass	21B1	4070	4/13	109	49.3	59.2	81.0	57.0*
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Not directly on this drainage

* Adjusted 1948-62 average

APPENDIX 2

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT					
			1966		:P a s t		R e c o r d	
			Date of Survey	Snow Depth (In.)	Water Content: (In.)	Water Content: (In.)	1948-62 Avg.	

Snow Surveys made on or about April 15, 1966 (Cont.)

BAKER RIVER

Dock Butte	21A11A	3800	4/15	166	79.3	67.8	106.6	--
Easy Pass	21A7A	5200	4/15	178	86.2	85.1	117.0	--
Jasper Pass	21A6A	5400	4/15	204	97.7	84.9	104.1	--
Koma Kulshan	21A17	800	4/15	5	2.3	--	--	--
Marten Lake	21A9A	3600	4/15	180	88.5	78.3	107.5	--
#Panorama	21A5	4300	4/15	209	98.3	84.9	88.9	--
Rocky Creek	21A12A	2100	4/15	82	40.5	28.6	45.2	--
Schreibers Meadow	21A10A	3400	4/15	150	74.8	61.8	80.0	--
S. F. Thunder Cr.	21A14A	2200	4/15	1	0.4	0.0	2.6	--
Sulphur Creek	21A13	1600	4/15	38	16.3	12.6	--	--
Three Mile Creek	21A15	1600	4/15	0	0.0	--	--	--
Watson Lakes	21A8A	4500	4/15	168	78.1	67.0	96.8	--

NOOKSACK RIVER

Panorama	21A5	4300	4/15	209	98.3	84.9	88.9	--
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ENTIAT RIVER

Entiat River Tr. +	20A34a	3150	4/11	24	9.8	New Aerial Marker		
Pope Ridge	20B20	4300	4/13	21	8.8	New Course		
Pugh Ridge +	20A32a	6400	4/11	70	28.6	New Aerial Marker		
Snow Brushy +	20A35a	3850	4/11	63	25.8	New Aerial Marker		
Tommy Creek +	20B21a	5300	4/11	28	11.4	New Aerial Marker		

* Adjusted 1948-62 average

Not directly on this drainage

+ Snow water equivalent estimated from aerial stadia observations

STATION	DATE	TIME	WIND	WAVE	SEA	WATER	TEMP	WIND	WAVE	SEA	WATER	TEMP
1000	10/10/55	10.00	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Some examples of the data recorded at the station (10/10/55)

TABLE 1

STATION	DATE	TIME	WIND	WAVE	SEA	WATER	TEMP	WIND	WAVE	SEA	WATER	TEMP
1000	10/10/55	10.00	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

TABLE 2

STATION	DATE	TIME	WIND	WAVE	SEA	WATER	TEMP	WIND	WAVE	SEA	WATER	TEMP
1000	10/10/55	10.00	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

TABLE 3

STATION	DATE	TIME	WIND	WAVE	SEA	WATER	TEMP	WIND	WAVE	SEA	WATER	TEMP
1000	10/10/55	10.00	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

* All data from 10/10/55 to 10/10/55
 * All data from 10/10/55 to 10/10/55
 * All data from 10/10/55 to 10/10/55

APPENDIX 3
SNOW DATA MAY 1, 1966

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	Date of Survey	SNOW COVER MEASUREMENT				
				1966	: P a s t R e c o r d			
				Snow Depth (In.)	Water Content: (In.)	Water Content (In.)	1948-62 Avg.	

U P P E R C O L U M B I A D R A I N A G E

PEND OREILLE RIVER

Baree Creek	15B11	5500	5/2	77	39.4	45.2	58.8	49.1
Baree Midway	15B16	4600	5/2	52	24.8	New Course		
Benton Spring	16A3	4900	4/28	28	12.0	11.0	21.6	18.2
Benton Meadow	16A2	2344	4/28	0	0.0	0.0	0.0	0.0*
Boyer Mountain	17A2	5250	4/29	39	19.4	30.4	27.9	24.1*
Brush Creek	14A4	5000	4/27	19	7.2	10.2	12.4	10.7*
Bunchgrass Meadow	17A1	5000	4/26	50	23.8	30.1	33.1	28.6
Hoodo Creek	15C1	6200	4/26	88	41.2	56.6	55.2	50.2*
Lookout	15B2	5250	4/29	66	30.0	36.6	44.3	36.4
Nelson	Canada	3050	4/29	22	8.3	6.0	13.4	5.2**
Schweitzer Bowl	16A6	4500	4/29	49	22.2	19.7	30.6	--
Schweitzer Ridge	16A5	6100	4/29	102	47.0	47.5	56.2	--
Smith Creek	16A1	4800	5/2	83	43.1	44.2	56.4	47.5*
Winchester Creek	17A3	2970	4/30	0	0.0	2.4	0.0	--

KETTLE RIVER

Barnes Creek	Canada	5300	4/28	51	21.9	18.9	24.0	--
Boulder Road	18A2	1450	4/26	0	0.0	--	0.0	--
Butte Creek	18A3	4070	4/26	9	3.4	7.1	5.2	--
Cabin Creek	18A8	3170	4/26	0	0.0	0.0	0.0	--
Carmi	Canada	4100	5/1	0	0.0	0.0	0.0	--
Farron	Canada	4000	4/29	16	6.7	7.1	11.9	--
Goat Creek	18A4	3595	4/26	0	0.0	0.0	0.0	--
Monashee Pass	Canada	4500	4/28	31	13.5	12.0	16.3	12.9**
Old Glory Mountain	Canada	7000	4/29	63	29.7	28.4	35.9	29.2**
Snow Caps Creek	18A5	2150	4/26	0	0.0	0.0	0.0	--
Snow Caps Trail	18A6	2720	4/26	0	0.0	0.0	0.0	--
Summit G. S.	18A7	4600	4/26	7	2.5	7.2	6.4	--

SPOKANE RIVER

Copper Ridge	16B2	4800	5/3	39	18.7	27.6	44.0	29.3
Forty-nine Meadows	15B3	5000	4/29	48	22.8	20.2	40.0	32.3
4th of July Summit	16B3	3100	4/29	0	0.0	0.0	3.2	--
Granite Peak	15B13A	6000	4/29	87	45.0	--	53.3	--
#Lookout	15B2	5250	4/29	66	30.0	36.6	44.3	36.4
Lost Lake	15B14A	6000	4/29	114	49.8	70.9	74.4	--
Lower Sands Creek	16B1	3400	5/3	31	13.4	16.6	28.8	14.2*

Not directly on this drainage
* Adjusted 1948-62 average
** Average for years of record

APPENDIX 4

DRAINAGE BASIN and SNOW COURSE			SNOW COVER MEASUREMENT					
			1966		: P a s t R e c o r d			
			Date	Snow	Water	: Water Content (In.)		
			of	Depth	Content:	1948-62		
No.	Elev.	Survey	(In.)	(In.)	:1965	1964	Avg.	
<u>SPOKANE RIVER (Cont.)</u>								
Medicine Ridge	15B4A	6150	4/28	91	41.8	--	52.7	--
Outlaw Creek	15B12	3750	4/29	19	8.2	--	16.5	--
<u>OKANOGAN RIVER</u>								
Aberdeen Lake	Canada	4300	4/29	2	0.7	0.0	3.3	1.5**
Blackwall Mountain	Canada	6250	5/2	86	34.0	33.9	48.4	37.1**
Bouleau Creek	Canada	5000	4/30	18	6.8	8.7	10.6	6.9**
Brookmere	Canada	3200	5/1	9	3.2	2.4	9.1	5.5**
Clark +	19A8a	7000	4/30	42	16.8	--	24.2	--
Enderby	Canada	6250	4/26	92	39.8	41.8	39.9	--
#Freezeout Meadows	20A2	5000	4/28	65	29.2	33.2	37.1	33.7*
Hamilton Hill	Canada	4900	4/30	16	7.1	9.3	18.0	10.6**
#Harts Pass	20A5A	6500	4/27	85	39.5	47.5	52.8	51.6
Isintok Lake	Canada	5510	4/28	9	3.2	4.8	--	--
Lost Horse Mountain	Canada	6300	5/3	13	4.2	10.6	13.2	9.4**
McCulloch	Canada	4200	4/28	3	0.9	2.8	4.9	2.9
Missezula Mountain	Canada	5100	5/1	0	0.0	8.5	9.2	4.3**
Mission Creek	Canada	6000	4/30	51	18.9	21.1	23.9	21.3**
Monashee Pass	Canada	4500	4/28	31	13.5	12.0	16.3	12.9**
Muckamuck +	19A9a	6390	4/30	26	10.4	--	16.8	--
Mutton Creek No. 1	19A1	5700	5/1	6	2.4	8.5	8.0	9.9
Mutton Creek No. 2	19A4	6000	5/1	26	10.3	14.6	12.2	15.3
Nickel Plate Mtn.	Canada	6200	5/3	13	4.9	8.1	12.8	8.3**
Postill Lake	Canada	4500	4/29	17	6.1	4.1	7.8	6.6**
Rusty Creek	19A3	4000	5/1	0	0.0	0.0	0.0	1.5*
Salmon Meadows	19A2	4500	5/1	0	0.0	3.8	3.2	5.1
Silver Star Mtn.	Canada	6050	4/28	62	26.4	22.0	32.4	23.9**
Starvation Mtn. +	19A10a	6750	4/30	48	19.2	--	22.0	--
Summerland Reserv.	Canada	4200	4/26	12	3.9	--	--	--
Trout Creek	Canada	4700	5/1	8	2.7	3.7	6.8	4.9**
<u>METHOW RIVER</u>								
Harts Pass	20A5A	6500	4/27	85	39.5	47.5	52.8	51.6
#Mutton Creek No. 1	19A1	5700	5/1	6	2.4	8.5	8.0	9.9
#Mutton Creek No. 2	19A4	6000	5/1	26	10.3	14.6	12.2	15.3
#Rusty Creek	19A3	4000	5/1	0	0.0	0.0	0.0	1.5*
#Salmon Meadows	19A2	4500	5/1	0	0.0	3.8	3.2	5.1

Not located directly on this basin

* Adjusted 1948-62 average

** Average for years of record

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APPENDIX 5

DRAINAGE BASIN and SNOW COURSE			SNOW COVER MEASUREMENT					
			1966		: P a s t R e c o r d			
			Date of Survey	Snow Depth (In.)	Water : Content: (In.)	Water Content (In.)	1948-62 Avg.	
No.	Elev.				:1965	1964		
<u>CHELAN LAKE BASIN</u>								
Rainy Pass	20A9	4780	4/27	67	32.3	42.2	51.1	45.1*
Safety Harbor	20A30A	6300	4/28	53	23.4	24.7	--	--
<u>ENTIAT RIVER</u>								
Brief	20B19	1600	4/26	0	0.0	0.0	0.0	--
Entiat River Tr. +	20A34a	3150	4/27	0	0.0	New Aerial Marker		
Pope Ridge	20B20	4300	4/28	4	1.7	New Course		
Pugh Ridge +	20A32a	6600	4/27	55	24.0	New Aerial Marker		
Snow Brushy +	20A35a	3850	4/27	33	14.4	New Aerial Marker		
Tommy Creek +	20B21a	5300	4/27	22	9.6	New Aerial Marker		
<u>WENATCHEE RIVER</u>								
Berne-Mill Creek	21B23	2925	4/29	29	13.7	18.2	33.7	--
Blewett Pass No. 2	20B2	4270	5/2	5	2.7	4.3	13.5	10.4
Chiwaukum G. S.	20B16	1810	4/29	0	0.0	0.0	0.4	--
#Fish Lake	21B4	3371	5/3	25	12.6	17.6	37.4	26.2*
Lake Wenatchee	20B5	1970	4/29	0	0.0	0.0	0.0	--
Leavenworth R. S.	20B17	1127	5/1	0	0.0	0.0	0.0	--
Merritt	20B18	2140	4/29	0	0.0	0.0	4.6	--
Stevens Pass	21B1	4070	4/29	96	43.4	54.7	79.2	54.8*
<u>SQUILCHUCK CREEK</u>								
Beehive Springs	20B3	4400	4/26	0	0.0	0.0	0.0	--
Scout-A-Vista	20B4	3400	4/26	0	0.0	0.0	0.0	--
<u>STEMILT CREEK</u>								
Jump-Off	20B8	4450	4/26	0	0.0	0.0	0.0	--
Stemilt Slide	20B6	5000	4/26	12	5.8	2.8	0.0	--
Upper Wheeler	20B7	4400	4/26	0	0.0	0.0	0.0	--
<u>YAKIMA RIVER</u>								
Ahtanum R. S.	21C11	3100	5/1	0	0.0	0.0	0.0	0.0*
Big Boulder Creek	21B9	3200	5/3	0	0.0	0.0	15.9	5.8*
#Blewett Pass No. 2	20B2	4270	5/2	5	2.7	4.3	13.5	10.4

Not directly on this drainage

* Adjusted 1948-62 average

+ Snow water equivalent estimated from aerial stadia marker

APPENDIX 6

DRAINAGE BASIN and SNOW COURSE			SNOW COVER MEASUREMENT					
			1966		: P a s t R e c o r d			
			Date of Survey	Snow Depth (In.)	Water : Content: (In.)	Water : Content: (In.)	1948-62 Avg.	
No.	Elev.				:1965	1964		
<u>YAKIMA RIVER (Cont.)</u>								
Bumping Lake	21C8	3450	4/27	21	10.9	4.4	12.8	10.5
Fish Lake	21B4	3371	5/3	25	12.6	17.6	37.4	26.2*
Lake Cle Elum	21B14M	2200	5/1	0	0.0	0.0	0.0	--
Morse Lake	21C17	5400	4/28	103	44.8	53.2	66.7	70.8*
#Olallie Meadows	21B2	3625	4/28	94	44.3	49.1	87.2	48.9*
#Satus Pass	20D1	4030	4/29	13	6.1	0.0	4.7	--
#Stampede Pass	21B10	3000	4/28	84	39.3	47.1	66.1	47.9*
Tunnel Avenue	21B8	2450	4/28	29	12.1	15.1	37.4	19.5
White Pass (E. Side)	21C28	4500	4/28	44	19.6	22.4	32.1	31.2*
White Pass (Leech L.)	21C27	4500	5/2	45	21.0	22.8	42.6	--
<u>AHTANUM CREEK</u>								
Ahtanum R. S.	21C11	3100	5/1	0	0.0	0.0	0.0	0.0*
<u>L O W E R C O L U M B I A D R A I N A G E</u>								
<u>ASOTIN CREEK</u>								
Spruce Springs	17C4	5700	4/29	43	21.6	--	--	--
<u>KLICKITAT RIVER</u>								
Satus Pass	20D1	4030	4/29	13	6.1	0.0	4.7	--
<u>WHITE SALMON RIVER</u>								
Cultus Creek	21C12	4000	4/29	104	50.8	38.4	55.4	52.1*
#Surprise Lakes	21C13A	4250	4/29	110	53.5	41.8	63.4	54.0*
<u>WIND RIVER</u>								
Oldman Pass	21D19	3100	4/26	55	26.7	9.4	19.6	8.8*
<u>LEWIS RIVER</u>								
Bob's Trail	21C21	2200	4/28	23	11.0	2.1	11.5	--
Calamity Ridge +	22D1a	2500	4/29	0	0.0	0.0	2.2	--

Not directly on this drainage

* Adjusted 1948-62 average

+ Snow water equivalent estimated from aerial stadia marker

APPENDIX 7

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT					
			Date of Survey	1966 Snow Depth (In.)	Water Content: (In.)	: P a s t R e c o r d		
						1965	1964	1948-62 Avg.

LEWIS RIVER (Cont.)

Council Pass +	21C18a	4200	4/29	81	38.9	25.0	50.5	35.7*
#Cultus Creek	21C12	4000	4/29	104	50.8	38.4	55.4	52.1*
Divide Meadow +	21C29a	5600	4/29	118	56.5	58.0	63.5	--
Grand Meadow	21C25	3500	4/28	46	21.2	19.7	25.4	--
Lone Pine Shelter	21C26	3800	4/25	116	57.2	40.6	53.2	--
Marble Mountain	22C5a	3200	4/29	95	49.0	7.8	50.1	--
#Mosquito Meadows	21C19	4100	Not Measured			--	--	48.4*
New Muddy River	22C6	1400	4/25	0	0.0	0.0	0.0	--
Oldman Pass	21D19	3100	4/26	55	26.7	9.4	19.6	8.8*
Smith Creek Road	22C4	2100	4/25	0	0.0	0.0	0.0	--
Spencer Meadow	21C20a	3400	4/29	62	31.0	0.0	27.3	--
Surprise Lakes	21C13A	4250	4/29	110	53.5	41.8	63.4	54.0*
Table Mountain +	21C24a	4200	4/29	103	49.5	32.8	51.9	--
Timbered Peak +	21D18a	3000	4/29	12	6.0	0.0	20.7	--

COWLITZ RIVER

Mosquito Meadows	21C19	4100	Not Measured			--	--	48.4*
Ohanapecosh	21C32	2200	5/2	7	3.1	2.2	10.6	--
Pigtail Peak	21C33	5900	5/2	106	53.1	64.9	97.2	--
#White Pass (E Side)	21C28	4500	4/28	44	19.6	22.4	32.1	31.2*
#White Pass (Leech L)	21C27	4500	5/2	45	21.0	22.8	42.6	--

P U G E T S O U N D D R A I N A G EWHITE RIVER

#Morse Lake	21C17	5400	4/28	103	44.8	53.2	66.7	70.8*
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GREEN RIVER

Stampede Pass	21B10	3000	4/28	84	39.3	47.1	66.1	47.9*
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SNOQUALMIE RIVER

Olallie Meadows	21B2	3625	4/28	94	44.3	49.1	87.2	48.9*
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SKYKOMISH RIVER

#Stevens Pass	21B1	4070	4/29	96	43.4	54.7	79.2	54.8*
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Not directly on this drainage

* Adjusted 1948-62 average

+ Snow water equivalent estimated from aerial stadia marker

APPENDIX 8

			SNOW COVER MEASUREMENT					
			1966	: P a s t R e c o r d				
DRAINAGE BASIN			Date	Snow	Water	: Water Content (In.)		
and			of	Depth	Content:	1948-62		
SNOW COURSE	No.	Elev.	Survey	(In.)	(In.)	:1965	1964	Avg.
<u>SKAGIT RIVER</u>								
Beaver Creek Trail	21A4	2200	4/27	10	4.4	4.8	8.4	6.6*
Beaver Pass	21A1	3680	4/28	74	35.6	29.3	41.9	37.1*
Devils Park	20A4	5900	4/27	88	39.4	43.8	55.3	49.4*
Freezeout Cr. Trail	20A1	3500	4/28	12	4.8	9.0	13.4	9.4*
Freezeout Meadows	20A2	5000	4/28	65	29.2	33.2	37.1	33.7*
#Harts Pass	20A5A	6500	4/27	85	39.5	47.5	52.8	51.6
Lake Hozomeen	21A2	2600	4/28	20	7.6	6.0	10.4	6.3*
Meadow Cabins	20A8	1900	4/27	0	0.0	0.0	5.1	2.8*
#Rainy Pass	20A9	4780	4/27	67	32.3	42.2	51.1	45.1*
Thunder Basin	20A7	4200	4/27	47	20.7	25.5	34.0	29.3*
<u>BAKER RIVER</u>								
Dock Butte	21A11A	3800	4/28	160	79.7	65.6	110.1	--
Easy Pass	21A7A	5200	4/28	179	85.5	--	134.4	--
Jasper Pass	21A6A	5400	4/28	196	93.9	84.0	121.0	--
Koma Kulshan	21A17	800	4/29	0	0.0	0.0	0.0	--
Marten Lake	21A9A	3600	4/28	172	86.2	73.6	115.8	--
Panorama	21A5	4300	Not Measured			83.6	99.8	--
Rocky Creek	21A12A	2100	4/28	68	34.1	16.0	35.7	--
Schreibers Meadow	21A10A	3400	4/29	141	74.2	57.8	92.3	--
S.F. Thunder Cr.	21A14A	2200	4/29	0	0.0	0.0	4.8	--
Sulphur Creek	21A13	1600	4/29	22	10.0	0.0	14.1	--
Three Mile Creek	21A8A	4500	4/29	0	0.0	0.0	0.0	--
Watson Lakes	21A8A	4500	4/28	160	77.9	64.8	98.9	--
<u>NOOKSACK RIVER</u>								
Panorama	21A5	4300	Not Measured			83.6	99.8	--
<u>O L Y M P I C P E N I N S U L A</u>								
<u>DUNGENESS RIVER</u>								

Not directly on this drainage

* Adjusted 1948-62 average

+ Snow water equivalent estimated from aerial stadia marker

APPENDIX 9

DRAINAGE BASIN and SNOW COURSE			SNOW COVER MEASUREMENT					
			1966		: P a s t R e c o r d			
			Date of Survey	Snow Depth (In.)	Water : Content: (In.)	Water : Content: (In.)	1948-62 Avg.	
<u>MORSE CREEK</u>								
Deer Park G. S.	23B13	4850	4/26	35	16.9	10.6	--	--
Morse Creek	23B12	5425	4/26	97	44.3	33.7	59.5	--
<u>ELWHA RIVER</u>								
Hurricane	23B3	4500	4/27	70	32.8	20.5	35.7	31.5*

* Adjusted 1948-62 average

Agencies Assisting with Snow Surveys

GOVERNMENT AGENCIES

Canada:

Department of Lands, Forests and Water Resources,
Water Resources Service, British Columbia

States:

Washington State Department of Conservation
Washington State Department of Natural Resources

Federal:

Department of the Army
Corps of Engineers
U. S. Department of Agriculture
Forest Service
U. S. Department of Commerce
Weather Bureau
U. S. Department of the Interior
Bonneville Power Administration
Bureau of Reclamation
Geological Survey
National Park Service

PUBLIC AND PRIVATE UTILITIES

Chelan County P.U.D.
Pacific Power and Light Company
Puget Sound Power and Light Company
Washington Water Power Company

OTHER PUBLIC AGENCIES

Okanogan Irrigation District
Wenatchee Heights Irrigation District

MUNICIPALITIES

City of Walla Walla
City of Tacoma
City of Seattle

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

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